

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (withdrawn) A method comprising:
integrating an inductor on a spacer between upper and lower dies in stacked dies; and
attaching conductors to electrically connect the inductor to one of the upper and lower dies.
2. (withdrawn) The method of claim 1 further comprising:
filling adhesive between the spacer and the upper die and between the spacer and the lower die.
3. (withdrawn) The method of claim 1 wherein integrating comprises:
integrating the inductor being a thin-film inductor.
4. (withdrawn) The method of claim 1 wherein integrating comprises:
integrating the inductor having a thickness substantially less than thickness of the spacer.
5. (withdrawn) The method of claim 4 wherein integrating comprises:
integrating the inductor having a multi-turn geometry.
6. (withdrawn) The method of claim 1 wherein integrating comprises:
integrating the inductor having an inductance of approximately between 1 nH to 10 nH.
7. (withdrawn) The method of claim 1 wherein attaching the conductors comprises:
attaching bumps to electrically connect the inductor to at least one of the upper and lower dies.
8. (withdrawn) The method of claim 1 further comprising:

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

filling adhesive between the lower die to a package substrate.

9. (previously presented) A spacer assembly comprising:
a thin-film passive element integrated on a spacer between upper and lower dies in stacked dies on a package substrate; and
conductors attached to the passive element to connect the passive element to at least one of the upper and lower dies.

10. (previously presented) The spacer assembly of claim 9 further comprising:
an upper adhesive layer to attach the spacer to the upper die; and
a lower adhesive layer to attach the spacer and the thin-film passive element to the lower die.

11. (previously presented) The spacer assembly of claim 10 wherein the thin-film passive element is placed between the spacer and the lower adhesive layer.

12. (previously presented) The spacer assembly of claim 9 wherein the passive element has a thickness substantially less than thickness of the spacer.

13. (previously presented) The spacer assembly of claim 12 wherein the passive element has a multi-turn geometry.

14. (previously presented) The spacer assembly of claim 13 wherein the passive element is an inductor having an inductance of approximately between 1 nH to 10 nH, or a resistor having a resistance of approximately between 0.2 ohms to 2.0 ohms.

15. (previously presented) The spacer assembly of claim 9 wherein the conductors comprises:
bumps attached to the passive element to electrically connect the passive element to at least one of the upper and lower dies.

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

16. (previously presented) The spacer assembly of claim 9 wherein the lower die is attached to the package substrate by an adhesive between the lower die and the package substrate.

17. (previously presented) A die assembly comprising:
a package substrate;
a plurality of stacked dies on the package substrate and having at least an upper die and a lower die; and
at least a spacer assembly between the upper and lower dies, the spacer assembly comprising:

a thin-film passive element integrated on a spacer between the upper and lower dies, and
conductors attached to the inductor to electrically connect the passive element to at least one of the upper and lower dies.

18. (previously presented) The die assembly of claim 17 wherein the spacer assembly further comprises:

an upper adhesive layer to attach the spacer to the upper die; and
a lower adhesive layer to attach the spacer and the thin-film passive element to the lower die.

19. (previously presented) The die assembly of claim 18 wherein the thin-film passive element is placed between the spacer and the lower adhesive layer.

20. (previously presented) The die assembly of claim 17 wherein the passive element has a thickness substantially less than thickness of the spacer.

21. (previously presented) The die assembly of claim 20 wherein the passive element has a multi-turn geometry.

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

22. (previously presented) The die assembly of claim 21 wherein the passive element is an inductor having an inductance of approximately between 1 nH to 10 nH, or a resistor having a resistance of approximately between 0.2 ohms to 2.0 ohms.

23. (previously presented) The die assembly of claim 17 wherein the conductors comprises:

bumps attached to the passive element to electrically connect the passive element to at least one of the upper and lower dies.

24. (original) The die assembly of claim 17 wherein the lower die is attached to the package substrate by an adhesive between the lower die and the package substrate.

25. (withdrawn) A method comprising:
integrating a resistor on a spacer between upper and lower dies in stacked dies; and
attaching conductors to electrically connect the resistor to one of the upper and lower dies.

26. (withdrawn) The method of claim 25 further comprising:
filling adhesive between the spacer and the upper die and between the spacer and the lower die.

27. (withdrawn) The method of claim 25 wherein integrating comprises:
integrating the resistor being a thin-film resistor.

28. (withdrawn) The method of claim 25 wherein integrating comprises:
integrating the resistor having a thickness substantially less than thickness of the spacer.

29. (withdrawn) The method of claim 28 wherein integrating comprises:
integrating the resistor having a multi-turn geometry.

30. (withdrawn) The method of claim 25 wherein integrating comprises:

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

integrating the resistor having a resistance of approximately between 0.2 ohm to 2 ohms.

31. (withdrawn) The method of claim 25 wherein attaching the conductors comprises:

attaching bumps to electrically connect the resistor to at least one of the upper and lower dies.

32. (withdrawn) The method of claim 25 further comprising:
filling adhesive between the lower die to a package substrate.

33. (withdrawn) A spacer assembly comprising:
a resistor integrated on a spacer between upper and lower dies in stacked dies; and
conductors attached to the resistor to connect the resistor to at least one of the upper and lower dies.

34. (withdrawn) The spacer assembly of claim 33 further comprising:
adhesive layers filled between the spacer and the upper die and between the spacer and the lower die.

35. (withdrawn) The spacer assembly of claim 33 wherein the resistor is a thin-film resistor.

36. (withdrawn) The spacer assembly of claim 33 wherein the resistor has a thickness substantially less than thickness of the spacer.

37. (withdrawn) The spacer assembly of claim 36 wherein the resistor has a multi-turn geometry.

38. (withdrawn) The spacer assembly of claim 33 wherein the resistor has a resistance of approximately between 0.2 ohm to 2 ohms.

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

39. (withdrawn) The spacer assembly of claim 33 wherein the conductors comprises:
bumps attached to the resistor to electrically connect the resistor to at least one of the
upper and lower dies.

40. (withdrawn) The spacer assembly of claim 33 wherein the lower die is attached
to a package substrate by an adhesive between the lower die and the package substrate.

41. (withdrawn) A die assembly comprising:
a package substrate;
a plurality of stacked dies on the package substrate and having at least an upper die and a
lower die; and
at least a spacer assembly between the upper and lower dies, the spacer assembly
comprising:
a resistor integrated on a spacer between the upper and lower dies, and
conductors attached to the resistor to electrically connect the resistor to at least
one of the upper and lower dies.

42. (withdrawn) The die assembly of claim 41 wherein the spacer assembly further
comprises:
adhesive layers filled between the spacer and the upper die and between the spacer and
the lower die.

43. (withdrawn) The die assembly of claim 41 wherein the resistor is a thin-film
resistor.

44. (withdrawn) The die assembly of claim 41 wherein the resistor has a thickness
substantially less than thickness of the spacer.

45. (withdrawn) The die assembly of claim 44 wherein the resistor has a multi-turn
geometry.

Appl. No. 10/720,812
Amdt. Dated November 15, 2006
Reply to Office action of August 15, 2006

46. (withdrawn) The die assembly of claim 41 wherein the resistor has a resistance of approximately between 0.2 ohm to 2 ohms.

47. (withdrawn) The die assembly of claim 41 wherein the conductors comprises:
bumps attached to the resistor to electrically connect the resistor to at least one of the upper and lower dies.

48. (withdrawn) The die assembly of claim 41 wherein the lower die is attached to the package substrate by an adhesive between the lower die and the package substrate.